

643, 763

**643,763 COMPLETE SPECIFICATION**

**1 SHEET**

FIG. 2

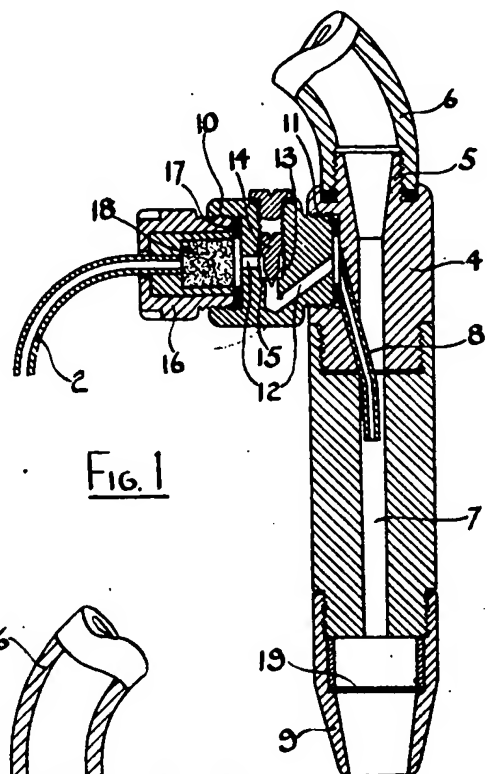


Fig. 1

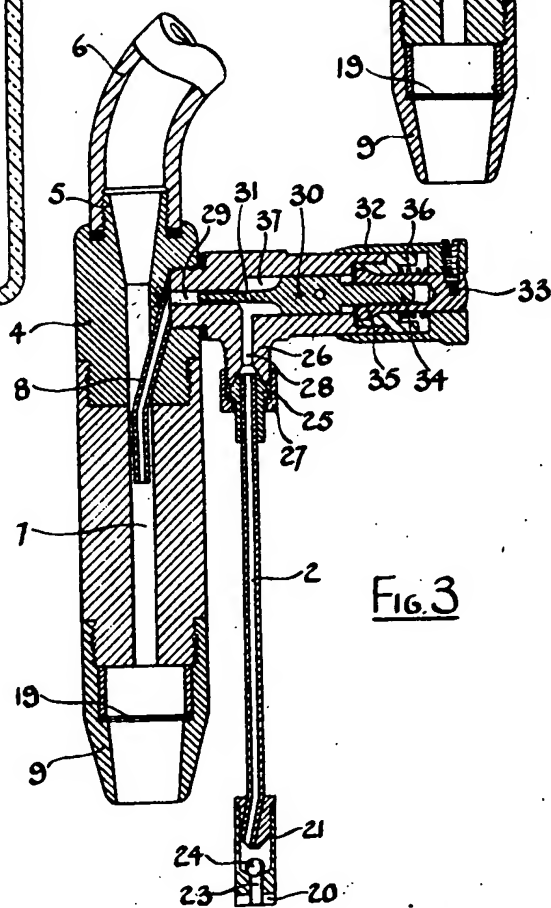


FIG. 3

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# PATENT SPECIFICATION

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643,763



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## PROVISIONAL SPECIFICATION

### Improvements in or relating to Devices for Mixing Disinfectant or Other Liquids with Water

We, GASKELL & CHAMBERS LIMITED, a British Company, of Dalex Works, Coleshill Street, in the City of Birmingham, do hereby declare the nature of this invention to be as follows:—

This invention relates to devices for mixing disinfectant or other liquid with water delivered from a tap and has for its object to provide an improved construction or arrangement applicable as a unit to a water tap and embodying means for regulating the proportion of disinfectant or other liquid and for preventing backflow thereof into the water supply pipe.

According to the invention the improved device for mixing a disinfectant or other liquid with water comprises a reservoir with a capillary tube leading therefrom into an outlet connected to a water tap, the arrangement enabling the flow of water from the tap to induce by suction a flow of liquid from the reservoir and cause such liquid to intermingle with the water in a controllable proportion.

In carrying the invention into effect and according to the preferred form thereof, a reservoir for disinfectant or other liquid is connected by a capillary tube to a housing adapted to be detachably connected to a water tap. The housing has an outlet passage freely communicating with the tap and the delivery end of the capillary tube extends into a position axially within the said passage, leaving an annular channel round it or a channel at one side of it through which the water can pass. When the tap is turned to the open position water flows through the outlet passage and ordinary mains pressure is such that a vacuum is created in the capillary tube and allows liquid to pass from the reservoir, enter

the outlet passage and mingle with the water issuing from its lower or outer end.

The housing includes a component detachably connected at one side and provided with a sealing washer, the said component containing a valve device for regulating the proportion of the disinfectant or other liquid and, when necessary, a filter. The end of the capillary tube leading from the reservoir terminates within the filter chamber which is independently detachable and whose end bears against a sealing washer. The capillary tube is continued by a passage within the said detachable component which leads to the control valve chamber and by a passage which connects the valve chamber with a short tubular component extending axially into the outlet passage as above described. The control valve member is conveniently a screw-threaded plug having a conical inner end co-operating with an annular seating.

The delivery nozzle at the end of the outlet passage is preferably provided with a layer or layers of metal gauze to form an anti-spray device.

The entry to the capillary tube within the reservoir is through ports in a valve chamber situated at the base of the reservoir, which reservoir is provided at the top with an air inlet. A short passage leading from these ports to the entry of the capillary tube is normally closed by a ball valve member which is forced off its seat when suction is created by flow of water from the tap. This ball valve member serves a double purpose. First it ensures that the disinfectant or other liquid can only flow through the capillary tube when the tap is open, when such liquid is carried away by the water flow and cannot flow back into the water

[Price 2/-]

supply pipe. Secondly, the ball valve prevents liquid draining back into the reservoir when the water tap is not in use and thus ensures an immediate supply of the disinfectant or other liquid as soon as the tap is opened.

Dated this 15th day of January, 1948.

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## COMPLETE SPECIFICATION

### Improvements in or relating to Devices for Mixing Disinfectant or Other Liquids with Water

We, GASKELL & CHAMBERS LIMITED, a British Company, of Dalex Works, Coleshill Street, in the City of Birmingham, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to devices for mixing disinfectant or other liquid with water delivered from a tap and has for its object to provide an improved construction or arrangement applicable as a unit to a water tap of the kind used for domestic supply purposes and embodying means for regulating the proportion of disinfectant or other liquid and for preventing backflow thereof into the water supply pipe.

According to the invention a device for mixing a second liquid with water includes a housing through which water is discharged, a connection from a reservoir for the second liquid connected to said housing and means whereby the second liquid is introduced by suction created by the flow of water characterised by a housing constructed to be detachably connected to a water tap, a detachable component at one side of said housing, a capillary tube connecting said component with the source of supply of the second liquid, a valve device for controlling the proportion of the second liquid disposed within a chamber in said component, and a capillary passage connecting said valve chamber with an outlet situated within the housing attached to the tap.

Reference will now be made to the accompanying drawings which show constructions according to the invention and in which:—

Fig. 1 is a sectional elevation of a mixing device,

Fig. 2 shows a reservoir adapted to be connected to the device shown in Fig. 1 and

Fig. 3 is a sectional elevation of an alternative construction.

Referring first to Figs. 1 and 2, a

reservoir 1 for disinfectant or other liquid is connected by a capillary tube 2 sealed into a cap or the like 3, to a housing 4 formed with a screw-threaded portion 5 to enable it to be detachably connected to a water tap 6. The housing 4 has an outlet passage 7 freely communicating with the tap 6 and the delivery end 8 of the capillary tube 2 extends into a position within the passage 7, such as to form an annular channel around it or a channel at one side of it, through which the water from the tap 6 can pass. When the tap is turned to the open position water flows through the outlet passage 7 and ordinary mains pressure is such that a vacuum is created in the capillary tube 2 and allows liquid to pass from the reservoir 1, enter the outlet passage 7 and mingle with the water issuing from a delivery nozzle 9 at its lower or outer end.

The housing 4 has a component 10 detachably connected at one side and provided with a sealing washer 11, the said component containing passages 12, a valve chamber 13, and a screw-threaded plug valve member 14 whose coned inner end co-operates with an annular seating 15 to regulate the proportion of the disinfectant or other liquid. The end of the capillary tube 2 leading from the reservoir 1 terminates within a filter chamber 16 which is independently detachable from the component 10 and bears at its inner end against a sealing washer 17. The capillary tube 2 terminates within the chamber 16 which is filled with a mass of filter material 18 beyond which the capillary tube is continued by the passages 12 and by the short tubular component 8 which extends into the outlet passage as above described.

The delivery nozzle 9 at the end of the outlet passage 7 is preferably provided with a layer or layers 19 of metal gauze to form an anti-spray device and mixing chamber.

The entry to the capillary tube within the reservoir 1 is through ports 20 in a valve chamber 21 situated at the base of

the reservoir, which reservoir is provided at the top with an air inlet 22. A short passage 23 leading from the ports 20 to the entry of the capillary tube 2 is normally closed by a ball valve member 24 which is forced off its seat when suction is created by flow of water from the tap 6. The ball valve member 24 serves a double purpose:—First it ensures that the disinfectant or other liquid can only flow through the capillary tube 2 when the tap 6 is open, when such liquid is carried away by the water flow and cannot flow back into the water supply pipe. Secondly, the ball valve member 24 prevents liquid draining back into the reservoir 1 when the water tap 6 is not in use and thus ensures an immediate supply of the disinfectant or other liquid as soon as the tap is opened.

In the alternative form of construction shown in Fig. 3, the valve member 14 is replaced by a micrometer controlled valve device. In Fig. 3 the capillary tube 2 terminates in a head 25 which is connected to a branch 26 on the housing 4 by a screw-threaded coupling sleeve 27. The passage 28 within the branch 26 communicates with a valve chamber 37 connected by a short passage 29 with the outlet passage 8. Within the valve chamber 37 is disposed a sliding member 30 having a valve element 31 formed integral with it. This valve element is of tapered form and is capable of entering the passage 29 to a variable degree. Adjustment in the position of the sliding member 30 and valve element 31 is effected by rotational movement of a sleeve 32 which surrounds the cylindrical exterior of the housing 4. The sleeve 32 is connected to a central stem 33 internally screw-threaded for engagement with a screw-threaded spindle 34 integral with the sliding member 30. Axial movement of the sleeve 32 is prevented by forming the inner end 35 of the stem 33 of enlarged diameter, this end being engaged by a guide 36 screw-threaded into the outer end of housing 4.

By this arrangement rotational movement of the sleeve 32 is converted into axial movement of the parts 30 and 34 to move the valve element 31 inwardly or outwardly of the passage 29 thereby decreasing or increasing the annular space through which the second liquid can pass through the tube 8 into the discharge passage 7. The exterior of the sleeve 32 has markings arranged which in conjunction with a fixed mark on the exterior of the housing 4 enable the valve element 31 to be set to enable a predetermined proportion of disinfectant or the like to be mixed with the water, or to enable the valve element 31 to be sealed

to cut off the supply from the capillary tube 2 when the sleeve 32 is turned to the zero position.

It is to be understood that no claim is made *per se* to the employment of a control valve for varying the proportion of the second liquid induced by the flow of water through the tap.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A device for mixing a second liquid with water including a housing through which water is discharged, a connection from a reservoir for the second liquid connected to said housing and means whereby the second liquid is introduced by suction created by the flow of water characterised by a housing constructed to be detachably connected to a water tap, a detachable component at one side of said housing, a capillary tube connecting said component with the source of supply of the second liquid, a valve device for controlling the proportion of the second liquid disposed within a chamber in said component, and a capillary passage connecting said valve chamber with an outlet situated within the housing attached to the tap.

2. A device according to Claim 1 wherein the reservoir for the disinfectant or other second liquid is provided with a valve device at the inlet to the capillary tube arranged to prevent back flow of liquid through the capillary tube when the water supply is shut off.

3. A device according to Claim 1, or 2 wherein the capillary tube terminates in a filter chamber communicating by way of passages and a valve chamber with a delivery passage situated axially or otherwise within a water discharge passage and of such dimensions as to leave a passage around it for water flow.

4. A device according to Claim 3 including a cone valve member mounted in said valve chamber and carried by a screw-threaded plug having means for adjusting the position of the said valve member to vary the proportion of the second liquid.

5. A device according to Claim 1 or 2 wherein the capillary tube is connected to a valve housing in which a tapered valve element is movably mounted in relation to an outlet passage.

6. A device according to Claim 5 wherein a micrometer sleeve capable of rotational but not axial movement is mounted around the housing and connected to the valve element which is adjusted axially to close the outlet

passage or to open it to a variable degree when rotary movement is imparted to the micrometer sleeve.

9. A device for mixing a second liquid  
5 with water constructed, arranged and adapted to operate as herein described with reference to Figs. 1 and 2 or 2 and 3 of the accompanying drawings.

Dated this 9th day of February, 1949.

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